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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/866,587	05/30/2001	Takehiko Nakai	35.C15390	4941

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EXAMINER

AMARI, ALESSANDRO V

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 06/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/866,587

Applicant(s)

NAKAI, TAKEHIKO

Examiner

Alessandro V. Amari

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoyama et al. U.S. Patent 5,122,903.

In regard to claim 1, Aoyama et al. discloses (see Figures 6, 10, 11, 12) a diffractive optical element, wherein said diffractive optical element has a grating structure in which at least two blazed type grating portions (31, 32) are overlapped with each other as described in column 5, lines 3-11, and in at least one grating portion of said two blazed type grating portions, structures smaller than a used wavelength are arranged in a periodic manner on all of light incident surfaces thereof as described in column 6, lines 15-24.

Regarding claim 2, Aoyama et al. discloses that said diffractive optical element is structured such that within an entire region of used wavelengths, diffraction directions are made different from each other, depending upon a polarization direction of a light beam incident on said diffractive optical element, and a diffracted light is concentrated only to one predetermined diffraction order as described in column 6, lines 25-46.

Regarding claim 3, Aoyama et al. discloses that said minute periodic structure is constituted by one kind of material, or two kinds of materials as described in column 3,

lines 43-44 and column 5, line 3, and occupation ratios of the respective materials within one period of said minute periodic structure are made different from each other along a periodic direction of said grating portion as shown in Figures 10 and 11.

Regarding claim 4, Aoyama et al. discloses that said diffractive optical element has a step-shaped grating portion as described in column 3, lines 66-68 and as shown in Figures 10 and 11.

Regarding claim 5, Aoyama et al. discloses that the minute periodic structure of the grating portion is varied along the periodic direction of the grating portion as shown in Figures 10 and 11.

Regarding claim 6, Aoyama et al. discloses that said minute periodic structure varied along the periodic direction of said grating portion is varied every step of the grating stepped portions as shown in Figure 10.

Regarding claim 7, Aoyama et al. discloses that the minute periodic structure of the grating portion is varied in a grating thickness direction as shown in Figures 10 and 11.

Regarding claim 8, Aoyama et al. discloses that the minute periodic structure varied in the grating thickness direction is varied every step of the grating stepped portion as shown in Figures 10 and 12.

Regarding claim 9, Aoyama et al. discloses that said used wavelength range corresponds to a visible light range as described in column 3, lines 43-44.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoyama et al. U.S. Patent 5,122,903 in view of Yajima European Patent EP 821258.

Regarding claims 10-15, Aoyama et al. teaches the invention as set forth above but does not teach a polarization converting element, wherein deflecting means is provided so that an emergence direction of one of a P-polarized light beam and an S - polarized light beam which has undergone polarization-separation to be diffracted in a diffraction direction different depending on a polarization direction by said diffractive optical element is made substantially coincident with an emergence direction of the other beam nor that a half-wave plate is provided in correspondence to one of a P-polarized light beam and an S-polarized light beam, which has undergone polarization-separation to be diffracted in a direction different depending upon polarization direction, by the diffractive optical element nor that deflecting means is provided so that an emergence direction of one of a P-polarized light beam and an S - polarized light beam which has undergone polarization separation to be diffracted in a diffraction direction different depending on a polarization direction by said diffractive optical element is made substantially coincident with an emergence direction of the other beam and a half-wave plate is provided in correspondence to one of the

P-polarized light beam and S-polarized light beam nor that an optical member is provided so that an incident direction of a light beam on said diffractive optical element is made substantially parallel to an emergence direction thereof. Nor does Aoyama et al. teach a projection type display apparatus, in which a light beam which is emitted from a light source unit and contains an S-polarized light component and a P polarized light component, is guided using the polarization converting element toward modulating means for modulating the light beam on the basis of an image signal and the light beam modulated by said modulating means is projected onto a predetermined surface by a projection optical system nor that said image signal is controlled in response to a signal supplied from an image processing means.

Regarding claim 10, Yajima teaches a polarization converting element (see Figure 5A), wherein deflecting means (332) is provided so that an emergence direction of one of a P-polarized light beam and an S polarized light beam which has undergone polarization-separation to be diffracted in a diffraction direction different depending on a polarization direction by said diffractive optical element is made substantially coincident with an emergence direction of the other beam as shown in Figure 5A.

Regarding claim 11, Yajima teaches (see Figure 5A) a polarization converting element, wherein a half-wave plate (381) is provided in correspondence to one of a P-polarized light beam and an S-polarized light beam, which has undergone polarization-separation to be diffracted in a direction different depending upon polarization direction a shown in Figure 5A.

Regarding claim 12, Yajima teaches (see Figure 5A) a polarization converting element, wherein deflecting means (332) is provided so that an emergence direction of one of a P-polarized light beam and an S polarized light beam which has undergone polarization separation to be diffracted in a diffraction direction different depending on a polarization direction is made substantially coincident with an emergence direction of the other beam as shown in Figure 5A and a half-wave plate (381) is provided in correspondence to one of the P-polarized light beam and S-polarized light beam.

Regarding claim 13, Yajima teaches (see Figure 6) an optical member (310) is provided so that an incident direction of a light beam on said diffractive optical element is made substantially parallel to an emergence direction thereof.

Regarding claim 14, Yajima teaches (see Figure 8) a projection type display apparatus, in which a light beam which is emitted from a light source unit (10) and contains an S-polarized light component and a P polarized light component, is guided using the polarization converting element (300) toward modulating means (803, 805, 811) for modulating the light beam on the basis of an image signal and the light beam modulated by said modulating means is projected onto a predetermined surface (815) by a projection optical system (814) as described in column 18, lines 55-58 and column 19, lines 1-17.

Regarding claim 15, Yajima teaches that said image signal is controlled in response to a signal supplied from an image processing means as described in column 19, lines 42-56.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the diffractive optical element as taught by Aoyama et al. in the optical element as taught by Yajima in order to provide polarization beam selectivity.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on (703) 308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava *ava*
June 24, 2002


Cassandra Spyrou
Supervisory Patent Examiner
Technology Center 2800